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NOTES ON GEOGRAPHIC DISTRIBUTION

Annelida, Hirudinida, *Stibarobdella moorei* (Oka, 1910): New distribution and host records

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ABSTRACT: The present report is the northernmost capture of the piscicolid leech *Stibarobdella moorei* in the western South Atlantic Ocean. This is also the first time *S. moorei* is found associated to a batoid fish in the Brazilian coast, the eyespot skate *Atlantoraja cyclophora*. *Stibarobdella moorei* was found fixed in the dorsal side of a male eyespot skate, caught by bottom trawl around of the São Paulo coast, southeastern Brazil. A brief description of the morphology of the parasite and a discussion on the taxonomic status of the *S. moorei* are presented.

The only group of annelids known to include species that parasitize elasmobranchs is the Hirudinea, or leeches (Caira and Healy 2004). Marine leeches are well known as parasitic of numerous elasmobranch species around the world, and such parasitism is restrict to marine leeches of Piscicolidae (Benz and Bullard 2004; Utevsky and Trontelj 2004). Approximately 20 known species of leeches have been reported from the skin of the sharks and rays (Caira and Healy 2004). Regarding marine leeches parasitizing elasmobranchs in Brazil, few data records are available. Studies of leeches of the elasmobranchs are scarce in Brazilian waters and thus the species list are incomplete, due to lack of interest in this subject, because of the very low number of specialists working along the Brazilian coast (Schlenz 1999; Christoffersen 2008).

Schlenz (1999) was the first to reports leech-fish associations, when he recorded *Branchellion* sp. fixed to cownose rays (*Rhinoptera* sp.), guitarfish (*Rhinobatos* sp.) and spotted eagle ray (*Aetobatus narinari* (Euphrasen, 1790)) in Cananéia, southern coast of São Paulo. More recently, *Stibarobdella macrothella* (Schmarda, 1861) was found on cooper shark (*Carcharhinus brachyurus* (Günther, 1870)) in southern Brazil by Soto (2000) and on the Caribbean sharpnose shark *Rhizoprionodon porosus* (Poey, 1861) from northeastern Brazil (Naércio Menezes, personal communication). *Stibarobdella moorei* (Oka, 1910) (Hirudinea, Piscicolidae) was found as parasite of three angel sharks (*Squatina argentina,* (Marini, 1930), *S. guggenheim* Marini, 1936 and *S. punctata* Marini, 1936) and on sandtiger shark *Carcharias taurus* Rafinesque, 1810, from southern Brazil (cited as *S. loricata* (Harding, 1924) by Soto (2003)).

In this article, we first report *S. moorei* (Oka, 1910) (Hirudinida) in a new elasmobranch host, the eyespot skate *Atlantoraja cyclophora* (Regan, 1903) (Rajidae: Arhynchobatinae), an endemic batoid elasmobranch that inhabits the bottom of the continental shelf and slope of the western South Atlantic, from Rio de Janeiro, Brazil (22° S) to the Gulf of San Jorge, Argentina (47° S) (Menni and Stehmann 2000; Oddone and Vooren 2004).

Specimens of *Atlantoraja cyclophora*, were caught by bottom trawl during III Oceanographic Cruiser organized by Universidade Estadual Paulista (UNESP/CLP) in October 2008, onboard the research vessel "Soloncy Moura" (South Coast Fisheries Research Center - CEPSUL/ICM-Bio). The specimen was collected about 100 m deep in a transect between 24°25'41.4" S, 44°57'49.8" W and 24°26'14.6" S, 44°59'22.4" W.

Parasite morphometry and identification follow Soto (2003) and Furiness *et al.* (2007) and the systematic arrangement follows Furiness *et al.* (2007), who considered *S. moorei* as the valid name and *S. loricata*, as a junior synonym. The specimen was fixed in 70% alcohol and deposited in the Helminthological Collection of the Departamento de Parasitologia of the Instituto de Biociências (CHIBB), Universidade Estadual Paulista (UNESP), municipality of Botucatu, state of São Paulo, Brazil.

One 450 mm total length (TL) male specimen of the eyespot skate (*A. cyclophora*) was captured with a 97 mm TL marine leech *S. moorei* (Voucher – CHIBB 5021) parasitizing its dorsal side. The parasite attachment caused two typical circleson host epidermal tissue (Figure 1), which were represented by a major lesion (oral sucker = os) and a minor one (caudal sucker = cs).

The general morphology of the *S. moorei* specimen herein examined fits the description presented by Furiness *et al.* (2007) in having the diagnostic characters to distinguish from all other known *Stibarobdella* species, as follows: no eyes; small, terminal caudal sucker; large, very deeply cupped oral sucker with marginal fringe; and three pairs of small marginal papillae (Figure 1). Concerning these two last features, previous studies consider *S. moorei* and *S. loricata* as distinct species on the basis of the oral sucker morphology (smooth margins and lacking papillae in *S. moorei* and fringed margin and three pairs of papillae

in *S. loricata*). Furiness *et al*. (2007) resurrect *S. moorei* and regard *S. loricata* as junior synonym of *S. moorei* clarifying that in the original description of *S. moorei* by Oka (1910) there are no data on the papillae number or arrangement, and the oral sucker was described as smooth. A more careful type specimen re-examination by these authors revealed the presence of three pairs of papillae and fringed oral sucker margins, as described early for *S. loricata* by Harding (1924) who did not examine the *S. moorei* holotype.

Stibarobdella moorei is known to occur in the Indian Ocean (Oka 1910), Japan and Tasmania (Furiness *et al*. 2007). Soto (2003) presented the first record of this species in the Atlantic Ocean (as *S. loricata*), parasitizing four shark species from southern Brazil. Previous known positively identified elasmobranch hosts were coastal demersal-benthic sharks (three *Squatina* and *Carcharias taurus*), totaling four species (Soto 2003). Herein is presented the first record of *S. moorei* on an identified batoid fish, *A. cyclophora*, becoming the fifth identified elasmobranch host for *S. moorei*. One unidentified skate (Rajidae) from Tasmanian waters, Australia, was also recorded infected by this species, but no further additional data was presented (Furiness *et al*. 2007). Moreover, the present report extends the previous known western South Atlantic distribution of the species to a northernmost position (about 24°26' S) in relation to the data reported by Soto (2003) in the latitude 29°34' S.

This widespread distributional pattern of *Stibarobdella* (notably *S. macrothella,* another marine leech recorded as parasitic of elasmobranch in Brazilian waters) is often explained by the highly mobile and power swimming hosts, since most elasmobranch species targeted by *Stibarobdella* spp. are "wide ranging sharks" (Sawyer *et al*. 1975; Williams 1982; Sawyer 1986; Benz and Bullard 2004; Furiness *et al*. 2007). Despite the fact that *S. macrothella* is regarded as parasitic of oceanic sharks and that the species of *Stibarobdella* feed primarily on sharks (Sawyer 1986). Thus the bottom sea associated marine leech life, the more adequate criteria to distinguish host specificity among the representatives parasites leech of the Pontobdellinae could be the elasmobranchs general

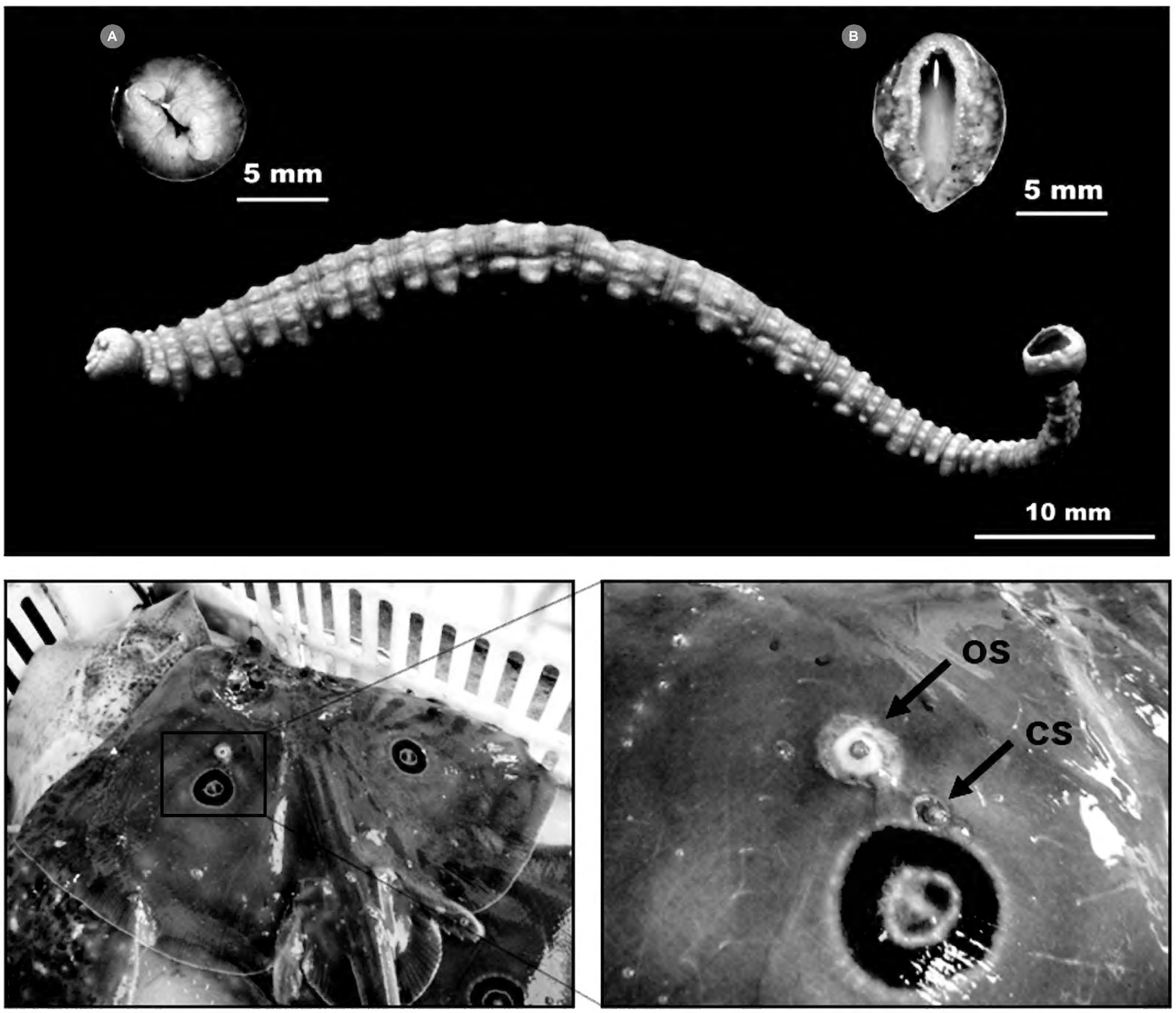

FIGURE 1. Terminal views of the caudal sucker (a) and oral sucker (b), in the last one showing the marginal fringe and three pairs of small papillae that characterize marine leech *Stibarobdella moorei*. This specimen was captured on dorsal epidermis of an adult male *Atlantoraja cyclophora* (total length, TL = 450mm) (photo inferior left), with the occurrence of two epidermal whitish rounded lesion next the left ocellus (photo inferior right), caused by the oral and caudal sucker (os and cs, respectively).

habitat, more than the imprecise terms "sharks" or "rays". In an updated list of elasmobranchs host for *S. macrothella* provided by Yamaguchi *et al.* (2008), there are at least 22 positively identified elasmobranchs, of which 18 are sharks and four are rays, but in fact 14 of the listed species are coastal-demersal or benthic and the remaining are coastal-oceanic pelagic.

Therefore, based on the above mentioned facts, the regarded worldwide distributional pattern of *S. moorei* and *S. macrothella* must be reviewed because most recorded elasmobranch hosts do not exhibit a global distribution pattern, some worldwide pelagic sharks recorded as hosts (*e.g.*, *Carcharhinus leucas* Valenciennes, 1839, *C. limbatus* (Valenciennes, 1839), and *Galeocerdo cuvier* (Péron and Lesueur, 1822) are more associated to coastal areas, and there are no evidences of transoceanic migratory movements (with the possible exception for *Carcharhinus falciformis* (Bibron, 1839) and *C. longimanus* (Poey, 1861), both also recorded as hosts for *S. macrothella*). Due to the complex *Stibarobdella* taxonomy, the lack of more conclusive studies on host specificity, and the fact that most elasmobranch hosts are coastal nearshore species, it is possible that *S. moorei* comprises actually a species complex rather than a single worldwide distributed species.

Finally, more elucidative taxonomic studies, including molecular sequence data, are suggested to solve this question.

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